

# image

News from Europe's weather satellite organisation.

## First EPS satellite prepares for launch

**Following many challenging years of development and hard work, MetOp-2, Europe's first operational polar-orbiting meteorological satellite, has finally arrived at its launch site in Baikonur, Kazakhstan, where it is currently undergoing final preparations for the scheduled lift-off in July.**

It took three flights of an Antonov 124, the unique Russian transport aircraft designed to carry very large cargo, to transfer the three components and associated support equipment of MetOp-2 from Toulouse to the Baikonur Space Cosmodrome, the main launch site for the Russian space programme. On arrival in Baikonur, the 4.2t satellite's service module, payload module and solar array, plus the necessary ground support equipment were transported by train to Starsem's payload processing facilities.

The inaugural satellite of the EUMETSAT Polar System (EPS), MetOp-2, will be blasted into polar orbit on 17 July by a Soyuz ST/Fregat launcher, the latest version of the legendary Soyuz family of

launchers. The main workhorse of the Soviet/Russian space programme, Soyuz, has evolved from the R7 rocket used to launch Sputnik, the world's first satellite, into space in 1957, and is credited with over 1,700 launches to date and a 98%-plus success rate.

**“Within six months EPS will be formally declared operational and users can start benefiting from MetOp-2's unique capabilities”**

Prior to the launch, MetOp-2 is scheduled to undergo 74 days of assembly and testing in Baikonur, followed by integration with the Fregat upper stage of the launcher and encapsulation within a new fairing. Six days before the launch, the encapsulated satellite will take a slow six-hour train ride to the launch complex where, over a three-day period, it will be integrated into the Soyuz launcher and the whole system checked out.

Continued on page 2

## CONTENTS

### 02 NEWS UPDATE:

- EUMETSAT and EC fast-track GMES services
- MSG-2 prepares for operational service
- Welcome to the 19th Member State

### 04 SPECIAL REPORT:

- The NWP SAF
- Jason-2 - securing ocean altimetry

### 06 FROM THE ARCHIVE:

- Users platform

### 07 PEOPLE:

- Meet the User Service Helpdesk Team
- South America benefits from EUMETCast

### 08 OVERVIEW & EVENTS:

- Global satellite update
- IMAGE is now going online
- Events diary

EPS (MetOp-2) launcher on the launch pad during a dry run test (January 2006)

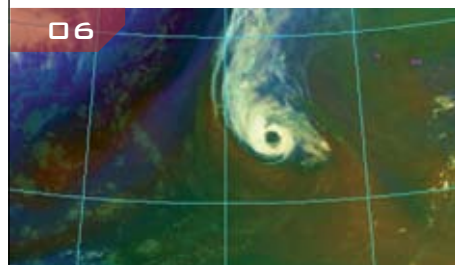


Image courtesy of Starsem

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## DIRECTOR-GENERAL'S DESK



Since EUMETSAT's foundation on 19 June 1986, Europe's citizens have benefited immeasurably from a wealth of superb quality satellite data gathered for weather forecasting and monitoring the climate and the environment. Today, meteorological satellites are recognised as providing the most important contribution to numerical weather prediction. The ensuing 20 years have seen EUMETSAT grow from the original 16 members to the current 19 Member States and 11 Cooperating States.

Back in 1986, EUMETSAT was responsible for operating a single programme, the first generation geostationary Meteosat satellites, which focused on weather monitoring. In 2000, the organisation's remit was extended to embrace climate monitoring, and its portfolio of satellite programmes has expanded to include Meteosat Second Generation and the forthcoming EUMETSAT Polar System and Jason-2 missions.

Once the operational service from geostationary orbit is provided by two MSG satellites, we will, indeed, be witnessing the transition from one generation to the next. The organisation will have achieved yet another milestone as it strives to meet the challenges of the future.

After the MetOp launch this summer EUMETSAT will enter with vigour into the area of Low Earth Orbit monitoring. This will provide our customers with atmospheric and environmental data and images of a quality hitherto unseen.

One issue to be resolved in the next two years is EUMETSAT's specific role within the European Union's activities in the context of the GMES initiative. Also, as the impact of severe weather events continues to be felt across the globe, we will have to work hard to ensure that EUMETSAT's resources are used to the maximum in all relevant activities. We must improve public awareness and understanding of the vital role satellite data and products can play in warning about such events and in mitigating their effects.

Given the economic environment, another major goal for the organisation is to continue to seek best value for money and to explore the potential for partners to help fund existing and future programmes and initiatives.

In any case, I firmly believe that the organisation is well equipped to meet the challenges to come. A good reason, therefore, to celebrate EUMETSAT's 20th anniversary this year. On 19 May, pages dedicated to our anniversary go live on the website at [www.eumetsat.int](http://www.eumetsat.int). Make sure you do not miss this joyous occasion!

**Dr. Lars P. Prahm**  
Director-General of EUMETSAT

Continued from page 1: First EPS satellite prepares for launch

The integrated launcher will be rolled out horizontally and erected vertically on the very same launch pad used to send the first man, Yuri Gagarin, into space. The final three days will consist of last-minute checks and rehearsals for the launch itself.

The satellite will be launched at 22:29 local time (18.29 CET) with a north-east trajectory towards Svalbard and north Greenland. The first stage consists of four strap-on boosters (which nominally burn for 118 seconds before being jettisoned) mounted around the "central core" or second stage. This second stage nominally burns for 290 seconds, and two seconds before burnout the engines of the third stage ignite and it separates from the central core. After engine cut-off and separation of the fourth stage (Fregat), the third stage performs an avoidance manoeuvre. Two Fregat burns are necessary to send MetOp-2 into a sun-synchronous polar orbit.

There is no launch window for the whole launch of this satellite, if there are any delays, for example owing to weather conditions, the launch would be delayed by 24 hours. Once it is in orbit the first activity will be the deployment of the solar array, which will be performed using a predefined onboard command sequence.

## “EPS's polar-orbiting MetOp satellites will provide incredibly detailed information about the entire Earth”

The European Space Operations Centre in Darmstadt will assume control of the satellite and carry out the Early Orbit Phase operations over approximately three days before handing control over to EUMETSAT. Over the next two months, the functionality of the satellite and its instruments will be checked out in the satellite in-orbit verification phase. The remainder of the commissioning phase will then be completed, including validation of the product processing chains.

“We anticipate that within six months, the EPS mission will be formally declared operational and users in Europe and beyond can start benefiting from MetOp-2's unique capabilities,” reports Dr. Lars P. Prahm, EUMETSAT's Director-General. “Its payload of state-of-the-art instruments will provide incredibly detailed information about the entire Earth, including atmospheric temperature and moisture profiles - data which are crucial for numerical weather prediction models and mapping weather, climate and the environment.”

**For more technical information about the launch schedule please visit the EPS web pages at [www.eumetsat.int](http://www.eumetsat.int).**

## EUMETSAT and EC fast-track pilot GMES services

EUMETSAT and the European Commission (EC) exchanged letters on 25 January, setting out their responsibilities and areas of cooperation in relation to Earth Observation and the Global Monitoring for Environment and Security (GMES) initiative. The letters also provide the basis for a future agreement between the two parties. Specifically, the EC will have access to EUMETSAT's services, technical support and existing satellite data. The EC, in turn, will endeavour to support initiatives to improve the use of satellite data and recognises EUMETSAT as the operational agency of choice for relevant GMES initiatives.

The EC aims to develop and bring into operational service, by 2008, an autonomous European global monitoring capability for environmental and security purposes based on three initial fast-track services in the areas of land monitoring, marine core services and support to emergency situations. EUMETSAT also intends to contribute to the implementation of future pilot services under GMES in the area of air quality. EUMETSAT's unparalleled experience and capability as a provider of high quality near-real-time satellite data with round-the-clock delivery are crucial to the operational remit of GMES and constitute a key element of the initiative's operational services.



Heinz Zourek, Director-General of the EC's Enterprise and Industry Directorate General, and Dr. Lars Prahm, Director-General of EUMETSAT, cement the organisations' mutual commitment to the monitoring and protection of the environment.



## Welcoming the 19th Member State

The EUMETSAT community achieved a major milestone in its history when Slovakia became the first Cooperating State to graduate to full membership on 3 January 2006 - an impressively fast transition, as the republic only joined in July 1999.

Others poised to follow include Iceland, which signed a Cooperating State Agreement with EUMETSAT last December. The country is set to benefit in particular from the data and images generated by the new polar-orbiting series of MetOp satellites under the EPS Programme, the first of which, MetOp-2, is due to be launched shortly.

## MSG-2 prepares for operational service

The second of the Meteosat Second Generation satellites, MSG-2, soared successfully into orbit on 21 December 2005. Co-passenger to MSG-2 on the Arianespace GS-5 launcher was the Indian telecommunications satellite Insat-4A. The perfect launch was the crowning event of what was reportedly the shortest launch campaign in Arianespace history for an Ariane 5 vehicle. "It is further proof of the prowess and successful partnership of the space agencies and industry in Europe," said Dr. Lars Prahm, EUMETSAT's Director-General.

Post-launch, the European Space Agency performed the initial operations in the

Launch and Early Orbit Phase (LEOP) for EUMETSAT, and on 2 January handed MSG-2 over to the team in the EUMETSAT Control Centre in Darmstadt, who brought the satellite to its commissioning location at 6.5°W and commenced the commissioning phase. The first images from the Spinning Enhanced Visible and InfraRed Imager (SEVIRI) and the Geostationary Earth Radiation Budget (GERB) instrument were received on 24 January and 31 January respectively.

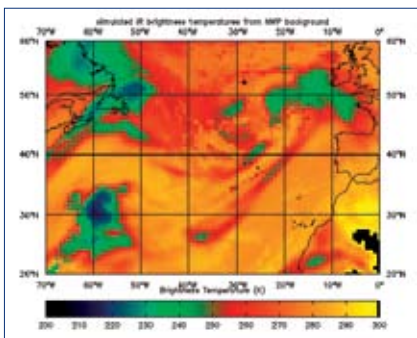
Essential image calibration and validation started in mid-March, followed by long-term performance measurements and optimization activities, all ongoing until

the end of June, when the commissioning results review will take place.

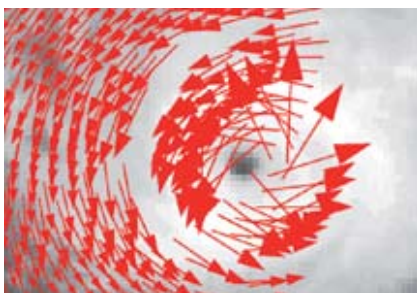
Meteorological product dissemination trials are expected to start in May 2006. Following decontamination and relocation to its final orbital position at 0° longitude, from 1 August the satellite will start its routine operational service, becoming the prime operational satellite. It will then be renamed Meteosat-9. Together with Meteosat-8, it will guarantee the meteorological community a reliable and continuous service of high quality data and images from geostationary orbit.

**Numerical Weather Prediction (NWP) is the basis of all modern global and regional weather forecasting. Its capabilities are being expanded by the NWP Satellite Application Facility (SAF), which is developing techniques and tools for the effective use of data and products generated by EUMETSAT and other satellite operators.**

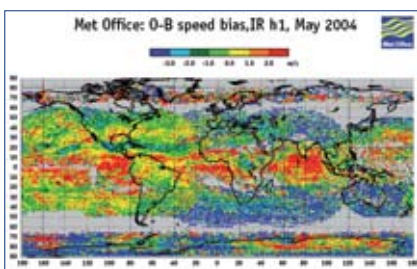
# THE NUMERICAL WEATHER PREDICTION SAF



Simulated Meteosat water vapour image using the RTTOV radiative transfer model and NWP fields



25 km resolution winds from tropical cyclone Rita measured by the SeaWinds scatterometer. Cloud background is GOES infrared



Map showing geographical comparison of winds versus the Met Office NWP background field

The improvement in the quality and quantity of satellite data over the last decade, and in the ability of meteorologists to process and assimilate the information into Numerical Weather Prediction (NWP) models, has made space-observed data the most important ingredient in NWP, which uses powerful computers to model the atmosphere and compute forecasts ranging from a few hours up to 10 days ahead. NWP underpins the forecasts of all the National Meteorological Services, and is a core activity of many of them.

Measurements from infrared and microwave radiometers, or sounders, on board polar-orbiting satellites provide NWP models with global information on temperature and humidity throughout the depth of the atmosphere. Wind speed and direction are deduced by tracking and measuring the movement of clouds, water vapour and other tracers with visible or infrared imagers. Meteorologists rely mainly on Meteosat and other geostationary satellites to provide this information because of the short time between successive images. However, over the ocean, data on winds near the water's surface can be obtained by measurements from scatterometers on polar-orbiting satellites.

Using these various observations to their best advantage in NWP is complicated and difficult. Not only is a detailed knowledge required of the many physical processes contributing to the measurements, but failure to take proper account of the often subtle error characteristics of the data can easily result in the observations damaging rather than enhancing the forecast.

The NWP SAF is helping significantly to improve NWP accuracy and the benefits derived from NWP by developing techniques and tools for the more effective use of satellite-generated data and products. The NWP SAF began developments in 1999 under the leadership of the UK Met Office in partnership with the European Centre for Medium-Range Weather Forecasts (ECMWF), the Dutch Meteorological Institute (KNMI) and Météo-France. Its core users are NWP centres in EUMETSAT's Member and Cooperating States, EUMETSAT's central processing facilities, licensed users and other SAFs.

NWP SAF users receive software packages for incorporation within their own systems, for example:

- **The ATOVS and AVHRR Pre-processing Package (AAPP)**, which processes data from sounders on board the US's polar-orbiting NOAA satellites. AAPP is also the processor used by receiving stations serving the EUMETSAT Advanced



## Jason-2 securing ocean altimetry

**All lights are green for the planned launch of Jason-2 in 2008.** Meeting this launch date has become imperative, owing to the demise of the TOPEX/Poseidon mission, which has finally been retired after 13 years of service. However, the newer generation of satellites is unlikely to match the record set by TOPEX/Poseidon because of their much shorter life expectancy of five years - the result of using off-the-shelf components in their construction (for cost reasons) which are less radiation resistant than the ones used for TOPEX/Poseidon - and also to a lower level of redundancy.

The race is now on and all the international partners involved - EUMETSAT, CNES, NASA and NOAA - are poised to meet the challenge.

- The system preliminary design review took place in Toulouse on 13 December, with all four agencies carefully checking system documentation, launch and early orbit phase requirements, system requirements and service specifications. In the ensuing review, no major issues were identified.
- The earth terminal infrastructure in Usingen was accepted and CNES has almost completed the integration of its equipment into the station. The complete earth terminal was accepted on 9 March 2006.
- The development of the HQ-based real-time processing system began immediately afterwards and is expected to be completed in 2007.
- The cooperative agreement to secure the Jason-2 programme was signed by the four partners on 11 April 2006.

The development of Jason-2's infrastructure may still be ongoing, but we are already looking to the future. Given Jason-2's five-year life expectancy and the lengthy period involved in developing a new satellite, it is of utmost importance that its replacement is ready to take over from 2013. First discussions to develop the baseline and the requirements for a new satellite will be taking place during the course of 2006.

Retransmission Service (EARS), which enables NWP centres to receive sounding data from large areas of the northern hemisphere within 30 minutes of observation time - vital for regional NWP.

- **The Radiative Transfer for TOVS (RTTOV) model**, which is able to accurately predict the radiances observed by a wide range of satellite infrared and microwave sensors, given atmospheric temperature and humidity profiles and surface characteristics, and which is fast enough for operational data assimilation.

- **Scatterometer processors**, which use radar backscatter from the ocean surface to provide information on low level winds and are used operationally by the OSI SAF. The NWP SAF is developing a generic scatterometer processor capable of interfacing with various instruments, including SeaWinds.

The value of observations is critically dependent on their quality, so as part of its remit the NWP SAF monitors the quality of many types of satellite observations and makes the results freely available via its website. The NWP SAF is continually

working to improve its products and to meet evolving user requirements, which in turn are often driven by the advent of new satellites and instruments. Hence it is well prepared for the imminent EUMETSAT Polar System, in anticipation of which significant enhancements have been made to AAPP, RTTOV and scatterometer processing in order to exploit challenging new instruments such as the Infrared Atmospheric Sounding Interferometer (IASI) and the Advanced Scatterometer (ASCAT). Planning is already underway for the US's National Polar Orbiting Environmental Satellite System (NPOESS) and the NPOESS Preparatory Programme.

For further information about the NWP SAF please visit: [www.metoffice.gov.uk/research/interproj/nwpsaf](http://www.metoffice.gov.uk/research/interproj/nwpsaf)

### About SAFs

SAFs are dedicated centres of excellence for processing satellite data and form an integral component of EUMETSAT's distributed applications ground segment. Located at National Meteorological Services in Member States, they use the expertise of the EUMETSAT community to process application-specific data from geostationary and polar-orbiting satellites for the generation of new products and tools for the meteorological and climate data user communities.



# archive

The 2005 hurricane season was a true record-breaker. Never before had so many hurricanes - the infamous Katrina, Wilma and Rita among them - been observed in the Gulf of Mexico. The relentless and disastrous chain of 27 storms even challenged the hurricane naming convention, with meteorologists having to revert to the Greek alphabet for the final hurricanes of the season.

One of these, hurricane Epsilon, also proved an exceptional event. Born somewhere between Bermuda and the Azores, its almost exclusively eastward track has no counterpart in recent records. Considering its northerly position in the Atlantic, Epsilon's hurricane-force period was unusually long in lasting from 2 December 18:00 UTC to 7 December 06:00 UTC, throughout which it had an open eye. The hurricane first appeared in an area of convective clusters, embedded in an upper-level low, which slowly organised themselves into a cyclonic structure. This picture was taken by Meteosat-8 on 5 December 2005, 06:00 UTC.

## Users Platform

### 01 TERMINATION OF METEOSAT-7 DIRECT DISSEMINATION SERVICES FROM 0°

Users still operating reception systems for Meteosat-7 services directly disseminated from 0° are reminded that the following services will terminate on 14 June 2006:

- WEFAX (all C, D and E formats)
- High Resolution Image HRI 0° (all A, B and L formats)
- Meteorological Data Dissemination (MDD)
- Data Collection Platform (DCP) Retransmissions
- Meteorological products generated from Meteosat-7 data at 0°

Users should make the transition to Meteosat Second Generation (MSG) services via EUMETCast as soon as possible to avoid any breaks in service.

### 02 SATELLITE CONFIGURATION IN 2006

With the successful launch and commissioning of MSG-2 (Meteosat-9), EUMETSAT will have full backup contingency for MSG services from 0°. It is planned that on 1 August 2006, MSG-2 (Meteosat-9) will enter operational service. At this time, Meteosat-7 will begin drifting to the Indian Ocean. After the three-month manoeuvre process, Meteosat-7 will take over the Indian Ocean Data Coverage service from the Meteosat-5 satellite. Following this successful hand-over, Meteosat-5 will continue as backup satellite until its decommissioning in early 2007.

### 03 WHAT'S NEW ON EUMETCAST

Progressively during 2006 users will find an increasing amount of polar satellite data and products available on EUMETCast. As part of the extension of the EUMETSAT Advanced Retransmission Service (EARS), ERS scatterometer data and NOAA satellite AVHRR data have already been introduced in early 2006. The ERS-SCAT demonstration service is a forerunner to the future pilot EARS-ASCAT service. The pilot EARS-AVHRR service will continue to expand during 2006, with the inclusion of data from additional A/HRPT stations within the EARS network.

The EUMETCast South America service commenced dissemination trials on 1 January 2006 with the formal start of service in April 2006. The service, comprising of MSG SEVIRI High Rate Image data disseminated every 15 minutes, will ensure continuity in the provision of Meteosat data to this region when the first generation Meteosat services from 0° terminate.

### 04 NEW IMAGE PRODUCTS ON THE WEB

Two new derived imagery products, daily Airmass and night-time Fog RGBs, have been included in the online product suite with a volcano detection product due to be released shortly. To view these products, consult the Image Gallery on our website.

### 05 CUSTOMER SATISFACTION SURVEY

Results of the customer satisfaction survey conducted in early 2005 are now available from the EUMETSAT website. We would like to thank all our users who have taken part in the survey. The comments received will help us to keep improving the services we provide to you.

For further information contact the User Service Helpdesk:

Tel: +49 6151 807 366/377  
 Fax: +49 6151 807 379  
 E-mail: [ops@eumetsat.int](mailto:ops@eumetsat.int)  
 Website: [www.eumetsat.int](http://www.eumetsat.int)

## PROFILE: THE USER SERVICE HELPDESK

# Prompt and expert help - whatever the query!



**The Helpdesk team - Pam, Ivalu and Debbie - are on the receiving end of almost 4,000 queries a year from members of EUMETSAT's user community. No mean feat, given the rapidly expanding scope of the organisation's activities.**

The User Service Helpdesk ensures that enquiries from users of EUMETSAT data, products and services are handled competently and promptly. Judging from the appreciative e-mails the team receives, it has many satisfied customers. The level of e-mails and telephone calls received is rising all the time, thanks to EUMETSAT's rapidly expanding activities. "When the Helpdesk started in December 1995 there was only one of us," says Pam. "Now there are three and there are days when we barely make it through all the e-mail enquiries!"

**"Judging from the appreciative e-mails, the Helpdesk has many satisfied customers"**

The dedicated team understands only too well that EUMETSAT's prime objective is to satisfy the user community "without whom there would be no reason for EUMETSAT's existence," reminds Pam. Enquiries are received from an ever-increasing user community. A typical day

could find the team handling an urgent enquiry from a director of a national meteorological service one minute and helping a student's school project the next. Sometimes, says Debbie, scientists or meteorologists contact the Helpdesk for very specific technical advice. "If we can't provide an immediate answer we'll promptly contact our in-house experts and get back to our customers as fast as possible - we don't like to keep them waiting."

The introduction of EUMETCast services in 2002 and MSG operations in 2004 led to a sharp increase in enquiries. "A large proportion of questions focus on EUMETCast - how to register, which form to use or how to extend the datasets," explains Ivalu. The influx of queries is expected to increase further, now that EUMETCast has started covering South America and will soon be distributing products and services generated by the new EUMETSAT Polar System of satellites.

Ask the three team members what they particularly enjoy about their work and without exception they mention its variety, the contact "with a lot of very

**"We get back to our customers as fast as possible - we don't like to keep them waiting"**

nice people" and the positive feedback. They also enjoy dealing with people from all over the world and receive enquiries in languages other than the official English and French. "Dealing with them is no problem, thanks to the international composition of EUMETSAT," says Pam. "Luckily the Helpdesk team is well equipped to support a multi-lingual user community - we can communicate in English, French, German, Italian and Mandarin."

#### Whatever your query or problem

The User Service Helpdesk team is here to help you.

Tel: +49 6151 807 366/377  
 Fax: +49 6151 807 379  
 E-mail: ops@eumetsat.int

## EUMETCast now serves South America

On 01 April EUMETSAT commenced the MSG service via EUMETCast to user communities across South America. The major beneficiaries of the new extended service are national weather services, environmental monitoring organisations, research institutes, air traffic control authorities and other organisations. The data will help to improve the forecasting and assessment of storms, floods and other hazardous and potentially

life-threatening weather phenomena that occur in the region.

EUMETCast already reaches a wide audience in Europe, the Middle East and Africa. The extension of the service to South America is a significant milestone in the success story of EUMETSAT's flexible and inexpensive data dissemination system. Based on digital broadcast technology, it utilises the services of

telecommunications provider Globecast Spain and a satellite operator, and ensures the delivery of high quality MSG data at 15-minute intervals.

For information on reception station requirements and setup procedure please visit [www.eumetsat.int](http://www.eumetsat.int) or contact the User Service Helpdesk (tel: +49 6151 807 366/377, fax: +49 6151 807 379 or e-mail [ops@eumetsat.int](mailto:ops@eumetsat.int)).

## GLOBAL SATELLITE UPDATE

### Europe:

- **Meteosat-5** provides the Indian Ocean Data Coverage Service at 63°E. Following the successful launch of MSG-2, it is planned to replace it with the Meteosat-7 satellite in 2006.
- **Meteosat-6** provides the operational Rapid Scanning Service and is the primary service backup at 10°E.
- **Meteosat-7** continues to operate at 0° longitude, in parallel with primary operational services from Meteosat-8. It is planned to be relocated to 63°E as of mid-2006 to continue the IODC coverage until the end of 2008.
- **Meteosat-8** has been fully operational since 29 January 2004 at 3.4°W. MSG data are transmitted via EUMETCast, which provides coverage over Europe, Africa, the Middle East and parts of North and South America.
- **MSG-2** (Meteosat-9, post commissioning) was successfully launched on 21 December 2005 and is currently in its commissioning phase.
- The first **MetOp** satellite (METOP-A post commissioning) is planned for launch on 17 July 2006.

### USA:

- **GOES-9** is currently stationed at 160°E and could act as an additional backup for the GOES series if necessary.
- **GOES-10 (West)** is operating at 135°W as the GOES West operational spacecraft.
- **GOES-11** at 105°W is on standby as a backup for both GOES East and GOES West.
- **GOES-12 (East)** is operating at 75°W as the GOES East operational spacecraft.
- **GOES-N** (future GOES-13), was launched in February 2006 and will eventually be located at 135°W or 75°W.
- **NOAA-12** was originally intended as a morning orbit satellite. It has drifted into an afternoon orbit and is in standby mode.
- **NOAA-14** is an afternoon orbit satellite in standby mode (acting as backup for NOAA-16 and -18).
- **NOAA-15** is the backup polar orbiting morning satellite for NOAA-17.
- **NOAA-16** is a backup afternoon satellite for NOAA-18.
- **NOAA-17** has operated as the primary morning satellite since October 2002. It no longer provides data since the failure of its AMSU-A1 scan motor in October 2003.
- **NOAA-18** is the primary afternoon satellite. It replaced NOAA-16 and is the first spacecraft of the Initial Joint Polar System (IJPS).
- **NOAA-N prime** is scheduled for launch in 2007/2008.

### Russia:

- **Meteor-3M-N1** continues to operate in a sun-synchronous morning polar orbit at 99.7°.
- **Meteor-M N1** is planned for launch in 2006 and **Meteor-M N2** in 2008.
- **Electro-L N1** is planned for launch in 2007 and will be positioned at 76°E.
- **Electro-L N2** is planned for launch in 2009.

### China:

- **Fengyun-1D (FY-1D)**, launched in May 2002, is the polar-orbiting meteorological satellite operating in a sun-synchronous early morning orbit.
- **FY-2A** continues to act as backup satellite at 86.5°E.
- **FY-2B** acts as backup satellite for FY-2C at 123.5°E.
- **FY-2C** is operating at 105°E as the primary geostationary satellite.
- **FY-2D** and **FY-2E** are planned for launch in 2006 and 2009 respectively.
- **FY-3A**, the first of the second generation of Chinese polar orbiting meteorological satellites, is planned for launch in 2007, FY-3B in 2010. This will be followed by another five satellites in this series until 2020.

### Japan:

- **GMS-5**, launched in 1995, was operating at 140°E well beyond its design lifetime of five years. Operation of this satellite was discontinued on 21 July 2005.
- **MTSAT-1R** went operational on 28 June 2005, it is stationed at 140°E.
- **MTSAT-2** was successfully launched on 18 February 2006.
- **India:**
- **KALPANA-1** (formerly METSAT), India's first exclusively meteorological satellite, is positioned at 74°E.
- **INSAT-2E**, the last of the INSAT-2 satellite series carrying a meteorological payload, is operating at 83°E with CCD payload only.
- **INSAT-3A** is operating at 93.5°E.
- **INSAT-3D** is planned for launch in the first quarter of 2007.

### Republic of Korea:

- **COMS** (Communication, Ocean and Meteorological Satellite) is planned for launch in 2008 and will be positioned at 116.2°E or 128.2°E.

## Image is now going online

This is the last fully printed edition of IMAGE. As from October 2006, the newsletter will be posted on our website in PDF format and registered subscribers will be notified via e-mail when it is available. As there is some interest in continuing the traditional mailing service we will provide a print format which will reach subscribers approximately three weeks after the online version.

This issue includes another questionnaire for readers who have yet to confirm which version of the newsletter they would prefer to receive – online or print. Please let us know as soon as possible as we will be discontinuing the existing mailing list from this issue.

Meanwhile, thank you for your continued interest in EUMETSAT's activities - and thanks particularly to everyone who has already provided us with their questionnaire responses, as well as their valuable comments and feedback, which will help us to improve our publication even further.

## Events Diary

- **2006 EUMETSAT Annual Meteorological Satellite Conference**  
12-16 June 2006, Helsinki, Finland
- **EUMETSAT's 20th anniversary**  
19 June 2006
- **Launch of MetOp, EUMETSAT's first EPS satellite**  
17 July 2006
- **EUMETSAT's official 20th anniversary celebrations**  
take place 3 July 2006, Darmstadt, Germany
- **59th EUMETSAT Council meeting**  
3-4 July 2006, Darmstadt, Germany
- **MSG-2 (Meteosat-9) commences operational service**  
1 August 2006

For further information about these events visit:  
[www.eumetsat.int](http://www.eumetsat.int)

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